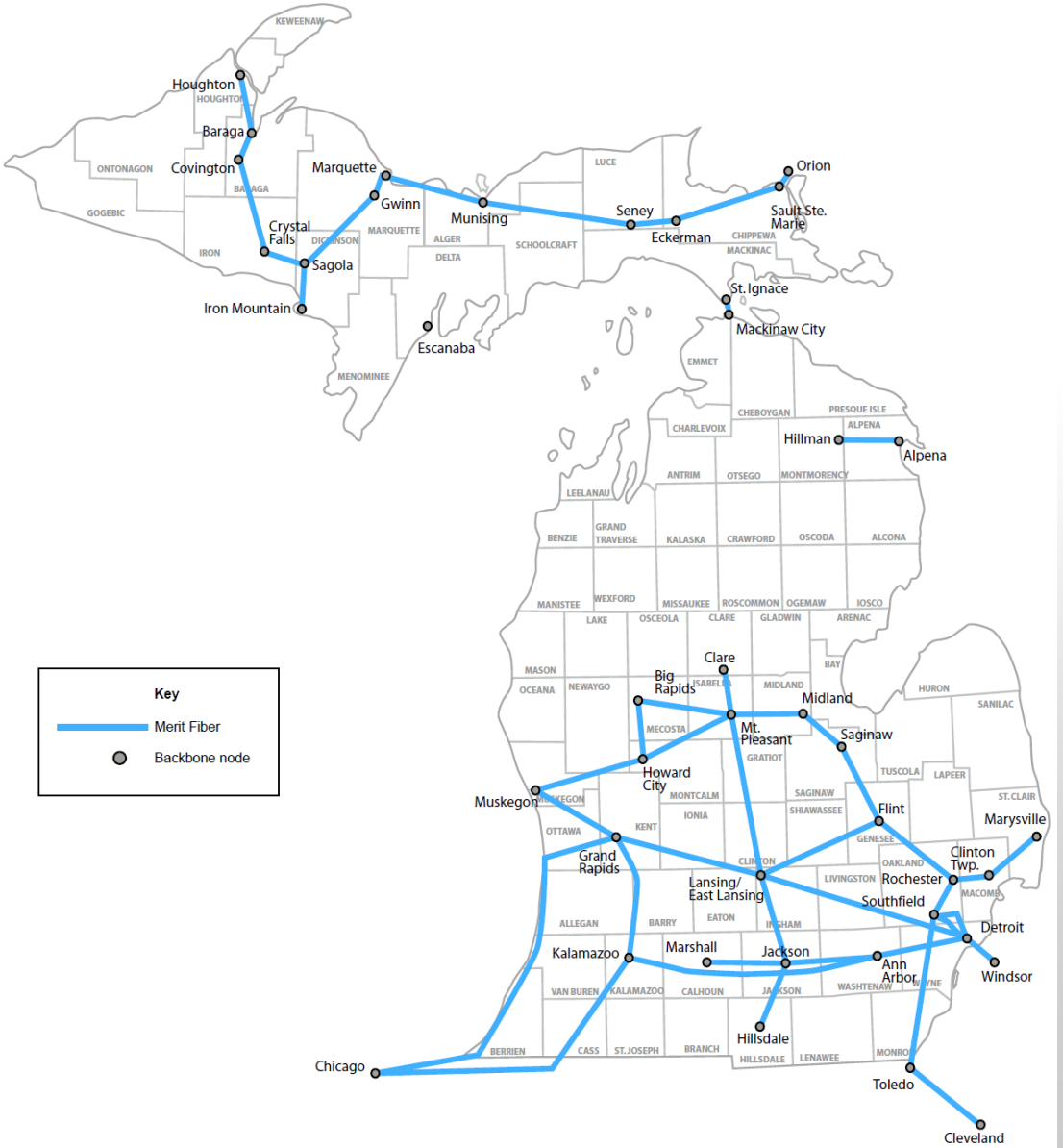
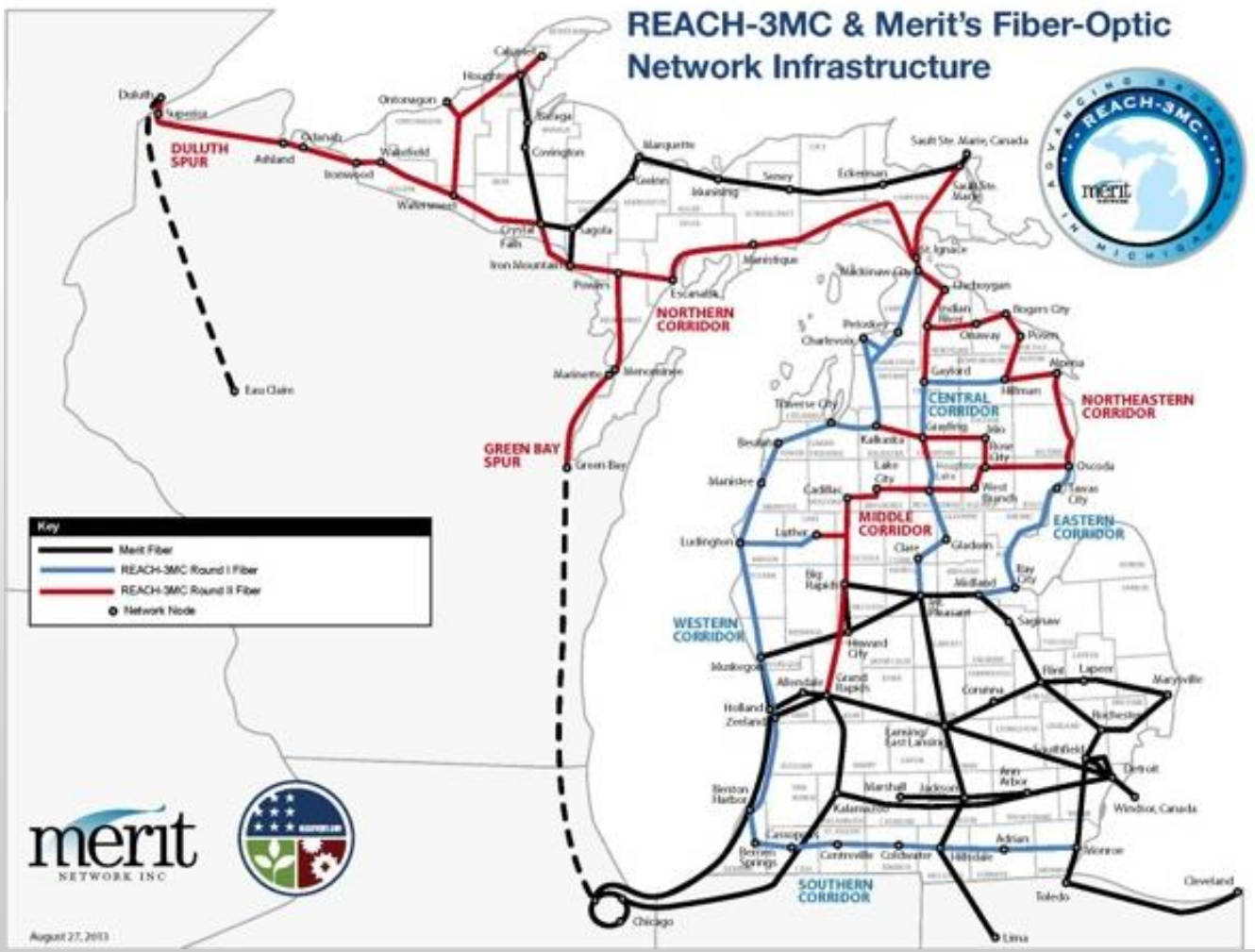
Merit Network
Michigan Research and Education Network

merit
NETWORK INC

Merit Fiber Backbone - Then



Merit Fiber Backbone - Now



Merit Connects Michigan CAIs

Merit Connects:

- 100% of Public Higher-Ed Institutions
- 78% of Community Colleges
- 31% Private Colleges
- 60% K-12 Intermediate School Districts
- 42% Library Cooperatives
- 10% Healthcare Sites
- 3% State and Local Government
- 9% Other Non-Profits

Investing in Fiber Optics

Merit has realized operational cost savings as a result of the fiber-optic infrastructure constructed with BTOP funds. Merit has been able to pass those savings on to our Members in the form of lower bandwidth rates.

Bandwidth Rates Before and After BTOP Funding

Bandwidth Level	Bandwidth Rate Prior to BTOP (2009)	Bandwidth Rate Today (2013)	Percentage of Decrease	Savings
6 Mbps	$7,089	$2,160	69.5%	$4,929
24 Mbps	$27,401	$8,640	68.5%	$18,761
100 Mbps	$78,104	$36,000	53.9%	$42,104
250 Mbps	$142,997	$90,000	37.0%	$52,997
500 Mbps	$208,472	$180,000	13.6%	$28,472
700 Mbps	$313,950	$252,000	19.7%	$61,950
1 Gbps	$393,300	$360,000	8.47%	$33,300

Fiber Optics to Schools and Libraries

Case Study #1

Rural School District– Prior to REACH-3MC, school district had a fixed capacity connection to their local Intermediate School District, which was not able to be upgraded at a price that was sustainable for the schools. School district was able to take advantage of the REACH-3MC backbone infrastructure and fiber-optic technologies to establish a fiber connection to the network at 1 Gbps, providing them the ability to subscribe at 150 Mbps. School district is planning to move more services to the cloud and has introduced a laptop & tablet program for students. Both of these initiatives would not have been possible without the BTOP project and by their previous connectivity options.

BTOP Success: This school is in a rural area and without the fiber-optic infrastructure their school system would not have access to high-speed connectivity at an affordable price. Furthermore, the infrastructure and connectivity has opened up opportunities for them to provide improved learning and content to their students.

E-Rate Success: Increased capacity to school building to 1 Gbps and leverage e-rate funding to support the increased service level based on a fixed cost of $93,897 annually for 3yrs. In the 4th year, the fixed annual cost drops to $3,750 saving the e-rate program $90,147 annually. Additionally, because of Merit's BTOP infrastructure available in the area the school system was able to put on the ballot a millage that was approved by the citizens to help bring 21st century network to their school system.

Fiber Optics to Schools and Libraries

Case Study #2

Library Cooperative– Prior to REACH-3MC, Co-op had 2 libraries connected via fiber, and 20 libraries connected via 1 or 2 leased T1 circuits. Merit was able to connect 14 libraries via 1 Gbps fiber. This capacity upgrade has begun to bring more interactive content opportunities to these libraries located in rural parts of Michigan's Upper Peninsula.

BTOP Success: The libraries are located in rural areas of the Upper Peninsula, with no cost-effective and scalable connectivity options beyond leased T1 circuits. The BTOP-funded fiber-optic infrastructure enables them to share more services over the network and bring more interactive/video content into the libraries. The libraries also have the ability to source interactive content to other locations.

E-Rate Success: Increased capacity to each library from 1.5 Mbps or 3.0M bps to 1 Gbps at an ongoing fixed cost for each location. The cost per location for a 1 Gbps connection is: $3,150 annually, plus a share of the aggregated Internet bandwidth.

The ***key success*** here is the ability to provide high-speed connectivity to these rural libraries as part of Merit Network's On-Net service.

Making the Case:
Fiber Optics for Schools and Libraries

Description	Current Capacity Level	Current OpEx Annual Recurring E-Rate Circuit Costs	CapEx Cost to Build Fiber	New Capacity Level	New OpEx Annual On-going Cost to E-Rate Program	On-going Savings to E-Rate Program	Notes/Comments	Network Usage with Fiber
Northern Michigan Rural K-12 School	3.0 Mbps	$11,700	$25,084	1 Gbps	$3,000	($8,700)	When the school needs more capacity the current cost would increase by $5,700/T1	Pent-up demand went from 3.0 Mbps to 60 Mbps
Northern Michigan Rural Library	3.0 Mbps	$12,000	$5,538	1 Gbps	$2,250	($9,750)	Same as above, this site T1 cost is also $5,700.	Pent-up demand went from 3.0 Mbps to 20 Mbps
Upper Peninsula Michigan Library	3.0 Mbps	$4,800	$12,481	1 Gbps	$1,950	($2,850)	Same as first example above, however, the cost of a T1 $2,400.	Pent-up demand went from 3.0 Mbps to 10 Mbps and growing
Upper Peninsula Michigan K-12 School	1.5 Mbps	$5,970	$15,077	1 Gbps	$1,950	($4,020)	Same as first example above, however, the cost of a T1 $3,600	Pent-up demand went from 1.5 Mbps to 10 Mbps to 20 Mbps and school hasn't started yet.
Totals		$34,470	$58,180			($25,320)	Total Annual Savings to E-Rate Program	